

## **Middle Devonian SHRIMP U-Pb age of the hornblende granite and its implication on the depositional age of the Yeoncheon Group**

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The Yeoncheon Group, comprising the major part of the Imjingang belt in the central Korean peninsula, consists mainly of metasedimentary rocks of stratigraphically (1) the lower calc-silicates rocks alternating with pelitic schists, quartzite and marble, and (2) the upper metapelites. The hornblende granite locally intrudes the lower part of the calc-silicate rocks, and is strongly deformed during the Triassic collision orogeny to have the same geometry of structural elements with the calc-silicate rocks. The granite is mylonitized to have isoclinal fold and sheath fold characterized by the development of mineral stretching lineation parallel to the fold axis. Alkali-feldspar clasts (<3mm) are common in the fine grained matrix consisting mainly of quartz, alkali-feldspar and plagioclase with minor hornblende, biotite, titanite, garnet and zircon. The analyzed granite samples are metaluminous I-type granite based on their aluminum saturation index [ASI = molar Al<sub>2</sub>O<sub>3</sub>/(CaO+K<sub>2</sub>O+Na<sub>2</sub>O)] ranging from 0.94 to 1.04, and belong to within plate and ocean-ridge granites. The granite samples show similar chondrite-normalized REE pattern characterized by moderately enriched light REE and relatively unfractionated heavy REE. The negative Eu anomalies are distinctive (Eu/Eu\*=0.3-0.7). Zircon grains separated from four different samples of the hornblende granites are transparent or translucent. Zircon grains show oscillatory zoned core and rarely thin and dark overgrowth rim under cathodoluminescence image. The U and Th concentrations of the analyzed zircon grains are 70–800ppm and 12–216ppm, respectively, and Th/U ratios are 0.04–1.28. Weighted mean age of the SHRIMP zircon U–Pb analysis yielded ca. 374.6±1.8 Ma (n=27), 374.2±1.3 Ma (n=22), 375.5±3.0 Ma (n=14) and 374.33±2.8 (n=14). There is no conspicuous age difference between the transparent and the translucent grains. Consistent U–Pb ages from four samples suggest the hornblende granite to be an Middle Devonian intrusive. The maximum depositional age of the Imjingang belt is known as ca. 447–397 Ma based on the SHRIMP U–Pb age of detrital zircons separated from the garnet-biotite paragneiss of stratigraphically the upper metapelites (Cho et al., 2005, GSA Abstract, 171-6). These SHRIMP U–Pb ages of the hornblende granite and garnet-biotite gneiss may constrain the depositional age of the Yeoncheon Group to be Middle Devonian.